CHAPTER 4. IN-HOUSE RESEARCH PROGRAM

The National Science Foundation charged the National High Magnetic Field Laboratory (NHMFL) with developing an in-house research program that utilizes the NHMFL facilities to carry out high quality research at the forefront of science and engineering and advances the NHMFL facilities and their scientific and technical capabilities.

To this end, the NHMFL established in 1996 an in-house research program that stimulates magnet and facility development and provides intellectual leadership for experimental and theoretical research in magnetic materials and phenomena. The NHMFL In-House Research Program (IHRP) seeks to achieve these objectives by funding research projects of normally one- to two-year duration in the following categories:

- small, seeded collaborations between internal and/or external investigators that utilize their complementary expertise;
- bold but risky efforts that hold significant potential to extend the range and type of experiments; and
- initial seed support for new faculty and research staff, targeted to magnet laboratory enhancements.

The NHMFL In-House Research Program (IHRP) strongly encourages collaboration across host-institutional boundaries; between internal and external investigators in academia, national laboratories and industry; and interaction between theory and experiment. Some projects are also supported to drive new or unique research, that is, to serve as seed money to develop initial data leading to external funding of a larger program. In accord with NSF policies, the NHMFL cannot fund clinical studies.

The IHRP is now five years old. Five solicitations have been completed with a total of 214 proposals being submitted for review. Of the 214 proposals, 110 were selected to advance to the second phase of review, and 45 were funded (21% of the total number of submitted proposals). The results from the funded projects have materialized and are noted in Chapter 2 of this report with the ◤**IHRP**◢ symbol.

2000 Solicitation and Awards

Beginning with the 2000 Solicitation, the IHRP moved to a pre-proposal process that was reviewed by the Research Program Committee augmented by members of the Users' Committee, who are elected by the laboratory's external users. The Committee selected the pre-proposals that met the review criteria, keeping in mind that funded projects had to meet the highest quality. The NHMFL reserved the right to turn down pre-proposals that did not fully meet the solicitation guidelines. Pre-proposals deemed to hold the highest merit were then passed on to the second review step as full proposals.

The Research Program Committee augmented by members of the Users' Committee provided the review of the full proposals. The proposals were evaluated based upon the goals and criteria stated in the solicitation.

A final determination of project funding was made by the NHMFL Chief Scientist.

Of the 46 pre-proposals received, the committee recommended that 18 pre-proposals be moved to the full proposal stage. Of the 18 full proposals, 6 proposals were funded. A breakdown of the review results is presented in the following tables.

IHRP Overview

Research Area	Pre-Proposals Submitted	Proposals Proceeding to Full Proposal Status	Projects Funded
Magnetic Resonance	17	3	0
Condensed Matter Physics	16	9	5
Materials Science & Engineering	13	6	1
TOTAL	**46**	**18**	**6**

Funded Projects

Lead P.I.	NHMFL Institution	Project Title	Project Duration
Jack Crow	NHMFL	*Development of low mass specific heat capacity in high magnetic fields*	2 years
Lloyd Engel	NHMFL	*Complex RF conductivity measurements of 2D electron systems in high magnetic fields*	2 years
Neil Harrison	LANL	*Millimeter-wave spectroscopy in pulsed magnetic fields*	2 years
Art Hebard	UF	*Luttinger liquid phase induced by ultraquantum magnetic fields*	2 years
Albert Migliori	LANL	*Development of advanced instrumentation for static and pulsed fields*	2 years
Arneil Reyes	NHMFL	*Studies of the vortex dynamics and spin fluctuations in high temperature superconductors by NMR at fields to 45 T*	2 years

2001 Solicitation

The 2001 Solicitation Announcement will be released March 9, 2001, with a pre-proposal deadline of April 6, 2001. Awards will be announced in the summer of 2001.